

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : SEPARATION MECHANISMS-MECH FMEA NO 02-3A -A7 -1 REV:10/09/87

ASSEMBLY : AFT ATTACH DEBRIS CONTAINMENT CRIT. FUNC: 1
P/N RI : V072-565244 CRIT. HDW: 1-
P/N VENDOR: VEHICLE 102 103 104
QUANTITY : 2 EFFECTIVITY: X X X
: ONE PER DEBRIS PHASE(S): PL LO X OO DO LS
CONTAINER

PREPARED BY: REDUNDANCY SCREEN: A- B- C-
DES R. H. YEE APPROVED BY: 10/1/87 APPROVED BY (NASA):
REL M. B. MOSKOWITZ DES *R.H. Yee for A.C. Ordome* SSM
QE E. M. GUTIERREZ REL *M.B. Moskowitz* QREL *E.M. Gutierrez* 10-22-87
R.H. Yee 10/1/87 *E.M. Gutierrez* 10-22-87

ITEM:

HOLE PLUGGER/COVER ASSEMBLY, ORBITER/ET AFT ATTACH

FUNCTION:

PREVENTS ESCAPE OF FRANGIBLE NUT, BOOSTER, DETONATOR OR PYRO CONNECTOR FRAGMENTS THROUGH HOLE IN BASE OF DEBRIS CONTAINER AFTER ORBITER/EXTERNAL TANK (ET) SEPARATION.

FAILURE MODE:

FAILS TO FUNCTION

CAUSE(S):

DEFECTIVE PART/MATERIAL OR MANUFACTURING DEFECT, PHYSICAL BINDING/JAMMING, CONTAMINATION/FOREIGN OBJECT/DEBRIS

EFFECT(S) ON:

(A)SUBSYSTEM (B)INTERFACES (C)MISSION (D)CREW/VEHICLE

(A) NONE.

(B) POSSIBLE INABILITY TO CLOSE ET DOOR DUE TO ESCAPING PYRO SEPARATION DEBRIS INTERFERING WITH ET DOOR LATCHING.

(C,D) POSSIBLE LOSS OF CREW/VEHICLE DUE TO AFT STRUCTURAL DAMAGE CAUSED BY EXCESSIVE HEAT ENTERING THE JAMMED OPEN ET DOOR.

DISPOSITION & RATIONALE:

(A)DESIGN (B)TEST (C)INSPECTION (D)FAILURE HISTORY (E)OPERATIONAL USE

(A) DESIGN

SPRING-LOADED PLUGGER FOLLOWS ATTACH BOLT WHEN BOLT ACCELERATES AWAY FROM ORBITER AFTER FRANGIBLE NUT SEPARATION. HOLE PLUGGER STOPPER HAS 60-DEG CONE ANGLE TO FACILITATE ENTRY INTO BOLT HOLE. NOTE: HOLE PLUGGER IS BEING REDESIGNED AND WILL BE QUALIFIED TO SUPPORT STS-26 (REF. MCR 11961).

(B) TEST

QUALIFICATION TESTS: SYSTEM QUALIFIED AS PART OF THE AFT ATTACH SEPARATION SYSTEM PER CR-45-565201-001 AND TAR-STS-81-0443; 4 ROOM TEMPERATURE/DUAL BOOSTER PYRO FIRINGS WITH THE HOLE PLUGGER.

OMRSD: VISUALLY INSPECT AFTER EACH FLIGHT FOR EVIDENCE OF DEFECTS.

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(C) INSPECTION

RECEIVING INSPECTION

INCONEL CERTIFICATION VERIFIED BY INSPECTION.

ASSEMBLY/INSTALLATION

MACHINE TOLERANCES ARE PER DRAWING AND ANSI Y14.5 AND ARE VERIFIED BY INSPECTION.

NONDESTRUCTIVE EVALUATION

PENETRANT INSPECTION IS REQUIRED AND VERIFIED BY INSPECTION.

HANDLING/PACKAGING

PACKAGED AND PROTECTED PER APPLICABLE SPECIFICATION AND VERIFIED BY INSPECTION.

(D) FAILURE HISTORY

ESCAPE OF DEBRIS THROUGH BOLT HOLE WAS CAUSED BY LATERAL DISPLACEMENT OF SPHERICAL WASHER WHICH JAMMED HOLE PLUGGER AND BY DEBRIS ACCELERATIONS GREATER THAN THAT OF THE PLUGGER (REF. MCR 11961).

(E) OPERATIONAL USE

NONE.